

## **DETAILED ACTION**

### ***Summary***

1. This is the initial Office action based on the Composite Current Collector application filed on 02/25/2005.
2. Claims 1-15 are currently pending and have been fully considered.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-8 and 14 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over GAUTHIER et al. (US 5,521,028).

As to Claims 1-2 and 7, GAUTHIER et al. discloses a composite collector assembly comprising a first resin film layer consisting of polypropylene have a thickness of 23 microns (col. 10, Example 1). On the resin layer, a layer of copper is formed (conductive treatment layer) having thickness of 500 angstroms or .05 microns (col. 11, Example 1). A third layer consisting of nickel (plating layer) is formed on the surface of the copper layer, said nickel layer having a thickness ranging from 0.3 microns (col. 11, Example 1). The conductive treatment layer of copper is the same as the conductive treatment layer used in the present application and therefore inherently has the same surface electric resistance characteristic of less than 1.3  $\Omega$ /cm, as claimed in claim 1.

Furthermore the plating layer of nickel is the same as the plating layer of the present application, and therefore inherently has a surface electric resistance of not greater than 40 m $\Omega$ /cm, as claimed in claim 1. The tensile strength is also inherently 0.8 kg/cm. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities or possibilities, *In re Robertson*, 49 USPQ2d 1949 (1999). The product-by-process limitations of claim 1 are not given patentable weight since the courts have held that patentability is based on a product itself, even if the prior art product is made by a different process (*In re Thorpe*, 227 USPQ 964, 1985).

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Moreover, a product-by-process limitation is held to be obvious if the product is similar to a prior art product (*In re Brown*, 173 USPQ 685, and *In re Fessman*, 180 USPQ 324). Claim 1 as written does not distinguish the product of the instant application from the product of the prior art. The weights of the three layers are not disclosed, however, they may be calculated using the density of each of the three materials and assuming that the surface areas are the three layers equal 1 cm<sup>2</sup>. With the areas all being equal to 1 cm<sup>2</sup>, the thickness of each layer equals the density of the respective layer multiplied by the thickness of the respective layer. The Examiner found the density of polypropylene to equal 0.895 g/cc, therefore giving a mass equal to 0.00206 g/cm<sup>2</sup>. Copper has a density of 8.96 g/cc, therefore giving a mass equal to .0000448 g/cm<sup>2</sup>. Lastly, nickel has a density of 8.88 g/cc, therefore yielding a mass equal to 0.000266 g/cm<sup>2</sup>. By plugging in the thickness and mass values for the respective variables in the expression in claim 1, one would obtain  $0.00237 \leq 0.0166$ , and one would clearly see that the expression is met.

As to Claims 3-5, the conductive treatment layer of copper is a conductive thin metal film (col. 11, example 1). The product-by-process limitations of claims 3-5 are not given patentable weight since the courts have held that patentability is based on a product itself, even if the prior art product is made by a different process (*In re Thorpe*, 227 USPQ 964, 1985). Claims 3-5 as written does not distinguish the product of the instant application from the product of the prior art.

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As to Claim 6, GAUTHIER et al. discloses wherein the thin metal film comprises copper (col. 11, Example 1).

As to Claims 8 and 14, GAUTHIER et al. teaches wherein the collector assembly is mounted in zig-zag form (wavy) (col. 10, lines 4-6 and Fig. 4) therefore the resin layer is also wavy.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 9-13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over GAUTHIER et al. (US 5,521,028) in view of SUZUKI et al. (JP 05-205746 as found in the IDS dated 02/25/2005).

As to Claims 9, 12 and 15, GAUTHIER et al. discloses a composite collector assembly comprising a first resin film layer consisting of polypropylene have a

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thickness of 23 microns (col. 10, Example 1). On the resin layer, a layer of copper is formed (conductive treatment layer) having thickness of 500 angstroms or .05 microns (col. 11, Example 1). A third layer consisting of nickel (plating layer) is formed on the surface of the copper layer, said nickel layer having a thickness ranging from 0.3 microns (col. 11, Example 1). The conductive treatment layer of copper is the same as the conductive treatment layer used in the present application and therefore inherently has the same surface electric resistance characteristic of less than  $1.3 \Omega/\text{cm}$ , as claimed in claim 1.

Furthermore the plating layer of nickel is the same as the plating layer of the present application, and therefore inherently has a surface electric resistance of not greater than  $40 \text{ m}\Omega/\text{cm}$ , as claimed in claim 1. The tensile strength and front/back current-carrying resistance are also inherently  $0.8 \text{ kg/cm}$  and not higher than  $100 \text{ m}\Omega$  respectively. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities or possibilities, *In re Robertson*, 49 USPQ2d 1949 (1999). The product-by-process limitations of claim 1 are not given patentable weight since the courts have held that patentability is based on a product itself, even if the prior art product is made by a different process (*In re Thorpe*, 227 USPQ 964, 1985). Claim 1 as written does not distinguish the product of the instant application from the product of the prior art. The weights of the three layers are not disclosed, however, they may be calculated using the density of each of the three materials and assuming that the surface areas are the three layers equal  $1 \text{ cm}^2$ . With the

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areas all being equal to  $1 \text{ cm}^2$ , the thickness of each layer equals the density of the respective layer multiplied by the thickness of the respective layer. The Examiner found the density of polypropylene to equal  $0.895 \text{ g/cc}$ , therefore giving a mass equal to  $0.00206 \text{ g/cm}^2$ . Copper has a density of  $8.96 \text{ g/cc}$ , therefore giving a mass equal to  $.0000448 \text{ g/cm}^2$ . Lastly, nickel has a density of  $8.88 \text{ g/cc}$ , therefore yielding a mass equal to  $0.000266 \text{ g/cm}^2$ . By plugging in the thickness and mass values for the respective variables in the expression in claim 1, one would obtain  $0.00237 \leq 0.0166$ , and one would clearly see that the expression is met.

GAUTHIER et al. further teaches the assembly wherein the resin film is covered on both faces with a metallic film, and said surfaces of metallic film covered with a plating film (col. 8, lines 10-16). GAUTHIER et al. does not expressly disclose the resin layer having many through holes.

However, SUZUKI et al. teaches a collector **4** consisting of a resin layer **1** comprising several through-holes (Fig. 1).

At the time of the invention, a person having ordinary skill in the art would have found it obvious to provide through-holes in the resin layer of the composite current collector of GAUTHIER et al. so as to decrease the weight of said current collector, as taught by SUZUKI et al. (Abstract).

As to Claims 10 and 11, GAUTHIER et al. teaches forming conductive layers of copper on opposite sides of the resin layer (col. 8 lines 10-16). Therefore, it is inherent that the conductive layers of GAUTHIER et al. are formed in a section of the through-holes of the resin layer of GAUTHIER et al. modified by SUZUKI et

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al. Also GAUTHIER et al. further teaches a plating layer of nickel formed on said conductive layers (col. 11, Example 1).

As to Claim 13 GAUTHIER et al. teaches wherein the collector assembly is mounted in zig-zag form (wavy) (col. 10, lines 4-6 and Fig. 4) therefore the resin layer is also wavy.

### ***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ADAM A. ARCIERO whose telephone number is (571)270-5116. The examiner can normally be reached on Monday to Friday 8am to 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO

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Customer Service Representative or access to the automated information system, call  
800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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